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November 4, 2013

Earnest Steinauer, Chairman, and  
 Nantucket Conservation Commission  
 2 Bathing Beach Road  
 Nantucket, MA 02554

RE: Comments on Nantucket DPW& SBPA Inc's Proposed 'Stabilization of Roadway & Utilities in the Public Layout of Baxter Road' Notice of Intent and Accompanying Material

Dear Conservation Commissioners:

On behalf of the Quidnet Squam Association, Inc., I am submitting the following comments on the proposed '*Stabilization of Roadway & Utilities in the Public Layout of Baxter Road*' as described in the October 13, 2013 Notice of Intent (NOI) submitted by the Nantucket DPW & Siasconset Beach Preservation Fund, Inc. to the Conservation Commission.

Also reviewed were the October 25, 2013 'Baxter Road Temporary Stabilization Application' report, the October 1, 2013 'Attachment A: Baxter Road Stabilization Alternatives Analysis' prepared by Milone & MacBroom on behalf of the applicants, and other comments and additional information uploaded on the Town's web site November 1, 2013.

### **Quidnet Squam Association**

The Quidnet Squam Association is an Association of properties owners most of whom own properties on or close to the beaches and dunes along the eastern shore of Nantucket north of the proposed project area. Because the Association member's properties are *downdrift* of the proposed project, they are concerned about possible adverse impacts to their beaches, dunes, barrier beach and developed properties in the form of potential project-related accelerated erosion and storm damage.

Although the NOI and accompanying information do not provide any coastal processes or erosion rate information for the reach of shoreline or coastal bank that is the subject of this NOI filing, based on many available technical documents and information gleaned from prior filings with the Conservation Commission, it is obvious that sediment eroding from the Sconset coastal bank (including the area of coastal bank that is the subject of this NOI) is a significant sediment source contributing to the healthy volume of beaches, dunes, and barrier beaches to the north of the Sconset Bluff, including the Quidnet Squam beaches and dunes and the barrier beach fronting Sesachacha Pond.

Selected information from several technical reports is included later in this report that documents that the Sconset coastal bank is significant sediment source to the downdrift Quidnet Squam shoreline areas to the north. Of particular note is the Coastal Planning and Engineering's (CP&E) information provided to the SBPF in their 2006 Report, Section 8, Table 10 and Figure 8 which clearly shows a significantly larger volume of sediment being transported to the north from the coastal bank, beach and nearshore areas in the project area.

### **Proposed Project: Preferred Alternative**

The proposed project spans across multiple contiguous privately owned properties from #85 to #107A Baxter Road, as well as proposed to be constructed on the Town-owned coastal beach fronting the coastal bank. As stated, the goal of project is to maintain vehicular access and utility service to the residential properties on Baxter Road from Bayberry Lane to the Sankaty Head Lighthouse property. It is stated that work is limited to those areas where Baxter Road appears to be in imminent danger of failure from bank erosion, i.e. where the top of the coastal bank is 30-40 feet from Baxter Road in some areas and 60-70 feet in other areas.

The preferred alternative is shown on the accompanying Plans and described in the October 25, 2013 Milone & MacBroom 'Baxter Road Temporary Stabilization Application' as temporary coastal bank toe protection along 1,500 linear feet of coastal bank extending from #85 to #107A Baxter Road by the placement of four 45-foot circumference geotubes, including a scour apron and a 4 foot diameter anchor tube. The geotubes will overlap creating a 2:1 slope with the top geotube at the FEMA-mapped 100-year flood elevation of 26' MLW. The geotube revetment will encroach onto the fronting coastal beach approximately 40' and an additional 5' for the scour apron and anchor tube, thus displacing approximately 69,900 square feet of coastal beach. This design will cover approximately half of the fronting coastal beach.

A sacrificial 2' minimum sand layer will cover the top geotube to elevation 28' MLW with the sacrificial sand layer covering the seaward face of the tubes at a 2.5:1 slope.

The applicant's propose an approximate 14.3 cubic yards of sand cover per liner foot of geotube for the 1,500 linear feet of geotubes (21,450cy). This sacrificial sand cover is proposed to protect the geotubes and mitigate for the loss of the coastal bank as a sediment source.

Winter sand replenishment is proposed to occur at a rate of one cubic yard per linear foot when 50% of the height of the bottom tube is exposed. Each spring (before April 30) the two feet of sand cover will be re-established over the geotubes.

Jute netting is proposed on the coastal bank above the geotubes, with planting of the coastal bank to occur in the spring. A low berm is proposed along the roadway edge to prevent runoff that is presently causing rill erosion down the coastal bank.

The project is stated to be 'temporary' with a suggested design life of 5 years, with maintenance when necessary, and according to the NOI is intended to provide a minimum but adequate level of protection for the short-term while long-term solutions are explored and implemented.

In terms of monitoring and maintenance requirements, it is stated for example, that repair of torn geotextile will be completed as soon as the beach is accessible, and sand replenishment will be completed as soon as appropriate based on weather conditions and time of year.

### **Eastern Shore of Nantucket is an Interactive System: A Littoral Cell**

Based on many available technical documents (cited in previous filings to the Conservation Commission), the coastal bank which is the subject of this filing is a major sediment/sand source contributing to the healthy volume of beaches, dunes, and barrier beaches along the Quidnet Squam shoreline areas to the north. Sediment is also cited to be transported at times towards the south; however, as cited above according to CP&E a significantly larger volume of sediment is transported north.

Thus, the eastern shore of Nantucket can be considered a ‘littoral cell’. As such, the coastal banks, coastal beach, coastal dunes, barrier beaches and near-shore areas are an interactive system: Any interruption in the *volume and timing* of the sediment supply from the coastal bank to the areas to the north can potentially result in adverse impacts in terms of accelerated erosion and storm damage to the beaches, dunes, and barrier beach, and as a result possible damage to landward developed property.

### **Potential Impacts to Downdrift Resources and Property**

#### **Additional Transects Request**

One of the ‘failure criteria’ stated in the filing information is ‘excessive change in the updrift or downdrift beach cross section(s)’. However, importantly, the failure criterion goes on to state that ‘*quantitative failure for updrift and downdrift impacts is difficult to develop with certainty at this time*’ (emphasis added). The criteria go on to state that, ‘if annual transects suggest changes are occurring as compared to historic data collected by SBPF over the past 15+ years, the DPW will meet with the Conservation Commission staff to determine if they believe the changes are a result of the project, and an appropriate course of action will be determined’.

The applicants offer, ‘if the Commission would like to have updrift and downdrift impacts monitored, the Town would be amenable to modifying the monitoring plan to include:

- Year 1 transect surveys in locations previously performed by the Woods Hole Group (WHG) in April and August; and,
- Years 2-5 transect surveys in locations previously performed by the WHG in April.

**That the transect surveys continue is an absolute necessity:** along with visual observations, transect surveys are a vital and necessary component of determining if adverse impacts are occurring to downdrift areas. We appreciate the Milone & MacBroom November 1, 2013 memo stating that transect surveying will continue and that a thorough analysis and interpretation of the data collected during the life of the project will be completed.

However, at present, and since the inception of the monitoring project in 1994, only 1 transect is monitored in the Quidnet area and 1 transect in the Squam area. Two transects along this shoreline area are clearly not sufficient to determine if adverse impacts are occurring to the Quidnet Squam areas.

1. Thus, the Quidnet Squam Association requests that Commission require not only that the *Southeast Nantucket Beach Monitoring Project* analyses by the Woods Hole Group (or other competent surveying group) continue to monitor the 44 existing beach profiles, but that several **additional survey profile locations be added along the Quidnet Squam areas, and that these additional transects and all other transects be surveyed not only in April and August, but prior to and immediately following artificial nourishment and pre- and post-coastal storms.**

These additional transects in the Quidnet Squam areas should extend from the nearshore area to the landward toe of the landwardmost coastal dune. Only with complete transects surveyed seasonally (following winter: April; and, following summer: August) and prior to and following coastal storms (Northeast storms and hurricanes) will sufficient data be available to attempt to quantify and make a determination if adverse impacts are occurring to downdrift coastal resources and developed property from the project.

2. **In addition, the Association is requesting that the Commission require a description of how the applicant's technical consultants will distinguish between far-field adverse impacts from the geotube revetment project and natural storm-induced erosion and storm damage north of the project area, particularly along the Quidnet Squam shoreline areas.**

Furthermore, a thorough data analysis and conclusions from each transect monitoring episode should be conducted by the Woods Hole Group as they occur in order to understand the evolution of the project and adjacent shorelines. An annual report will also be forthcoming.

#### Sand Nourishment Requirement

It is stated that 'winter replenishment will occur at a rate of one cubic yard per linear foot when 50% of the height of the bottom tube is exposed. Each spring the two feet of sand cover will be re-established over the geotubes.'

The volume and timing of sand proposed in the 'sand nourishment criteria' is simply not adequate to prevent and ensure downdrift adverse impacts will not occur as a result of the project.

The initially placed 14.3 cubic yards of sand per linear foot will be deposited *seaward* of the coastal bank over the geotubes, basically on the coastal beach and/or where the coastal beach would be absent the geotubes. The geotubes and sand nourishment displace approximately half of the summer beach area. The winter beach profile will be even narrower.

In this more seaward location the sand nourishment can be anticipated to erode faster during storm conditions than if the sediment were being eroded from the more landward semi-compacted coastal bank. In natural erosive action, the toe of the coastal bank would erode providing source sediment to the fronting beach; shortly thereafter – oftentimes **during** a moderate to major coastal storm and during each subsequent storm high tide storm cycle – the

upper portions of the coastal bank would slump providing additional natural sediment nourishment to the fronting beach that will subsequently be transported to adjacent and downdrift beaches. During northeast storms this naturally eroded source sediment is introduced continuously over several tidal cycles.

The proposed winter replenishment of 1 cubic yard per linear foot when 50% of the height of the bottom tube is exposed is not adequate to provide a continuous stream of source sediment to downdrift beaches, dunes and barrier beaches *during* a coastal storm; thus, the project will not prevent or minimize adverse downdrift impacts during a coastal storm.

This adaptive approach of adding winter replenishment of 1 cubic foot of sand suggests that the 14.3cy/linear foot of sand cover is anticipated to be eroded due to storm action.

One cubic yard per linear foot will more than likely completely erode early during storm conditions, leaving no further sand volume available to be transported downdrift – *during* a coastal storm - which is precisely when the littoral system requires the sand to reduce storm wave energy and prevent or reduce storm damage to downdrift areas.

This more than likely will result in a wave of erosion or ‘hot spot’ of erosion and/or storm damage moving alongshore downdrift. If a ‘hot-spot’ or erosion wave is moving downdrift, replacing sand over the geotubes ‘as soon as appropriate based on weather conditions’ and placing only 1 cubic yard per linear foot will not prevent subsequent erosion or storm damage as a result of an erosion wave.

Furthermore, the volume of sand nourishment remains a concern in that it may be lower than the volume that would erode during an excessively active coastal storm season. The proposed sand mitigation volume is an ‘average’ – which is generally acceptable; however, in this exceptionally high energy area, the sand mitigation volume may be too low to accommodate an above average coastal storm season. If additional sand volumes are not available ‘during’ a coastal storm, downdrift adverse impacts will more than likely occur.

In addition, the 18cy/lf of sand that will be removed from the beach to accommodate the placement of the bottom geotube, scour pad and anchor tube should be added to the 14.3cy/lf of sand cover or added during the winter or following storms. This 18cy/lf although being used in the placement of the geotubes is lost to the system in that it will be used as part of the geotube leveling pad. Only if the geotubes fail will the 18cy/lf be made available to the littoral system.

Thus, the concern of the Quidnet Squam Association is possible adverse impacts if the proposed ‘sand mitigation plan’ does not perform as anticipated by the applicant’s consultants. While we appreciate the proposed sand mitigation plan, *the placement of off-site mitigation sand seaward of the coastal bank and particularly the timing of sediment delivery to the north cannot mimic natural processes*, and could result in adverse impacts to downdrift properties.

3. **Thus, the Quidnet Squam Association is requesting a ‘beach and dune sand mitigation plan’ for their shoreline area to immediately be able to address the event that adverse impacts are noted along their section of the Nantucket eastern shore.**

This is somewhat similar to the fallback mitigation proposal of adding more sand to the ends of the geotube revetment if significant end scour occurs despite the initial additional sand proposed to be placed at the geotube revetment ends to attempt to mitigate end scour. The possibility of adding more geotubes at the flanking ends is also proposed.

The logistics (e.g. reserve sand stock piling) and commitment of providing sand mitigation along the Quidnet Squam shoreline and dune areas, if and when necessary, must be clearly outlined and deemed doable by the Commission and involved project specialists. As part of this *extended sand mitigation plan*, sand placement should not only be addressed in the project and immediately adjacent areas due to possible flanking, but also along the Quidnet Squam beach and dune areas in the event project-related erosion and storm damage are noted.

### **Regulatory Compliance: Nantucket and State Wetlands Protection Regulations**

#### **Proposed Project Description**

The proposed project is, in part, to construct a 1,500 linear foot ‘temporary’ coastal engineering structure, i.e. geotube revetment, on a sediment source coastal bank extending onto the fronting coastal beach, including mitigating sand cover, to protect a roadway and utilities from storm induced erosion.

The initial application proposed two distinct sections of tubes only at locations where roadway failure appears imminent and where no structures currently exist. However, as stated, in the NOI, the issue of ‘flanking’ cannot be resolved in the gap area between the 2 systems; therefore, a continuous run of geotubes from #85 to #107a Baxter Road is now proposed. Thus, the proposal now includes areas of the roadway that are and are not presently threatened from erosion.

#### **Coastal Banks and Coastal Beach: Regulatory Compliance**

The project proposes to armor a sediment source coastal bank. *Coastal banks* are defined, in part, as ‘the seaward face or side of any elevated landform, other than coastal dune, which lies at the landward edge of a coastal beach, coastal dune, land subject to tidal action or coastal storm flowage, or other coastal wetland’ in the Nantucket and MA Wetlands Regulations @ PART I, s. 1.02 DEFINITIONS and S. 10.30(2), respectively.

The Nantucket Wetlands Regulations @ Part 2: s. 2.05(B)(1) states, in part, ‘No new bulkheads, coastal revetments, groins, or other coastal engineering structures shall be permitted to protect structures constructed, or substantially improved, after 8/78 except for *public infrastructures*’ (emphasis added).’ The Nantucket regulations go on to state, ‘other coastal engineering structures may be permitted only upon a clear showing that no other alternative exists to protect a structure that has not been substantially improved or public infrastructure built prior to 9/78, from imminent danger.’

However, the MA Wetlands Protection Regulations @ 310 (CMR) 10.30(3) allow armoring a sediment source coastal bank to protect only '*buildings*' (emphasis added) constructed prior to August 10, 1978.

Thus, it appears that armoring a coastal bank to protect public infrastructure in imminent danger of loss due to erosion, e.g. a public roadway and utilities, may be permitted under the Nantucket Wetlands Regulations. However, there appear to be other regulatory compliance issues. As stated in the November 1, 2013 Milone & MacBroom memo, 'information regarding waiver requirements and regulatory compliance will be submitted under a separate cover form the town's attorney'. We await this submittal and will respond accordingly when it is made available.

Importantly, under the MA state Wetlands Protection Regulations armoring a sediment source coastal bank is allowed only to protect a *building* (emphasis added) constructed prior to August 10, 1978, not a roadway or utilities.

#### Limited Project Status

In Section A, 7(b) of the NOI and the Milone & MacBroom report (p. 2) the project is stated to be considered as a '*limited project*' pursuant to 310 CMR 10.24(c)(2) and, thus, may be considered for issuance of an Order of Conditions despite the state performance standards for sediment source coastal banks which allows consideration of a revetment only to protect a 'building' constructed prior to August 10, 1978. The project is proposed to protect a roadway and infrastructure, not a building. In fact, the proposed project would armor the coastal bank to temporarily protect 7 vacant lots and 3 lots with buildings (i.e. so-called 'gap lots').

How the project fits within the designation of a 'Limited Project' as checked in the Notice of Intent filing @ Section A, General Information; 7(b), and stated in the Milone & MacBroom report is unclear. The proposed project is a temporary (5-year life expectancy as stated in the NOI) coastal engineering structure that is proposed to armor an eroding coastal bank that is a highly significant sediment source to downdrift beaches, dunes and barrier beaches in order to temporarily protect a roadway and utilities from erosion and storm damage.

**It appears that the proposed project may not meet the criteria for a 'limited project':** it is not, as stated in the section of the Regulations cited in the NOI and Milone & MacBroom report, 'maintenance, repair and improvement (but not substantial enlargement) of structures, including buildings, piers, towers, headwalls, bridges and culverts which existed on November 1, 1987'. This provision specifically does not name 'roadways' as part of structures: the previous section @ 10.24(c)(1) addresses maintenance and improvement of existing 'roadways', but (is) limited to widening less than a single lane, adding shoulders, correcting substandard intersections or improving drainage systems'. It does not appear to meet either of these performance standards.

It is also interesting to note that the Nantucket regulations distinguish between a 'structure' and 'public infrastructure' (coastal bank section, Part 2: s. 2.05(B)(1)).

Thus, approval under an NOI filing under the state Wetlands Protection Regulations may not be appropriate, and a ‘*variance*’ from the state Wetlands Protection Regulations issued only by the DEP Commissioner may be required. A written legal opinion from the DEP may be appropriate before the Conservation Commission proceeds any further in the review of the proposed project to ensure legal compliance.

### Alternatives

The Nantucket Wetlands Regulations @ Part 2: s. 2.05(B)(1) states, in part, ‘No new bulkheads, coastal revetments, groins, or other coastal engineering structures shall be permitted to protect structures constructed, or substantially improved, after 8/78 except for *public infrastructures*’, and continue to state ‘other coastal engineering structures may be permitted only upon a clear showing that no other alternative exists to protect a structure that has not been substantially improved or public infrastructure built prior to 9/78, from imminent danger.’

While the geotubes *may* have a longer life expectancy, they have a greater potential adverse impact to beaches and dunes than biodegradable alternatives, e.g. coir and jute. While we appreciate the intent of having more time to develop long-term alternatives, the use of coir (or jute) that has shown to be successful in the short-term along the eastern shore of Nantucket will expedite the long-term alternative planning process, as these materials will more than likely not last as long as geotextiles. Geotextiles are also known to have a higher wave reflection factor than porous biodegradable material. Thus, although the applicants reduced wave reflection as much as possible by reducing the geotube revetment slope, fronting beach erosion may be higher with geotextiles, such as geotubes, than porous biodegradable material.

While we suggest that the geotubes may have a higher adverse impact, the biodegradable alternatives do not necessarily leak a sufficient volume of internal sand to prevent a deficit of source sand to downdrift areas, when the sand cover has eroded away – which we anticipate will occur. Thus, this highlights the importance of introducing a continuous sufficient volume of sand to the littoral system while considering the importance of the timing of the release of sand - during a storm – to prevent downdrift adverse impacts.

### **Coastal Processes, Shoreline Change and Sediment Transport along Nantucket’s Eastern Shore: Documented Justification for Additional Far-Field Monitoring and Mitigation**

Based on many available technical documents, it is obvious that sediment eroding from the Sconset coastal bank is feeding and contributing to the healthy volume of beaches, dunes, and barrier beaches to the north of the Sconset Bluff, including the Quidnet Squam beaches and dunes.

For example, based on the Woods Hole Group’s ‘SE Nantucket Beach Monitoring’, 60<sup>th</sup> Survey Report conducted during March 2013 and analyses published August 2013, it was documented, in part, that between November 1994 and December 2002 that the northern transects (86 through W – including the Quidnet Squam areas) for the most part revealed accretion, while the central Sconset bluff area eroded. In addition, from December 2001 through Sept 2012 the northern transects for the most part again accreted while the central Sconset bluff area eroded.



This analysis clearly suggests that a sediment transport relationship exists between the eroding Sconset bluff area and the Quidnet Squam shoreline areas. This sand source relationship is also documented in several technical reports as outlined below.

‘Net alongshore current movement and littoral transport of sand are primarily driven by tidal currents and run from *south to north* (emphasis added) along Nantucket’s eastern shore (Gutman, et al., 1979 in Tiffney and Andrews, 1990). Evidence for northerly flow and movement is provided by the existence of the six-mile-long tombolo and sand spit complex of Great Point, formed of wave and current deposited sediments, and found at the northern end of Nantucket Island. Hence, the net movement of sediments eroded from the Sankaty Bluff is to the north toward Sesachacha Pond....’ (Tiffney and Andrews, 1990).

*‘The littoral system will naturally transport nourishment material north and south of the project area* (emphasis added). Adjacent shorelines will accrete naturally as a result of the nourishment, with Sesachacha Pond widening approximately 40 feet’. Typically, the magnitude of shoreline change will decrease with increasing distance from the nourishment area. Extensive computer modeling results indicate that sediment transport from the project area will not detrimentally impact wave transformation or current flow’. (DMF 20: Response to DMF Comments on NOI: Attachment to Conservation Commission Meeting #3 Responses, Epsilon Associates, Inc., March 21, 2007).

Furthermore, all authors of historical shoreline changes along Nantucket’s eastern shore reference complex interactions among tidal currents, waves, and bathymetry. These complex interactions drive changes and migration in the offshore shoal configuration. These changing shoals configurations in concert with coastal storms change the focus of locations of wave energy along the shore and are the primary driving mechanism for historical erosion and accretion patterns and bluff erosion along the eastern shore.

For example, ‘the lack of long-term measurements of the alongshore sediment transport patterns in the project area necessitated the use of computer-hindcasted wave information in the determination of potential longshore transport rates. This analysis provided an estimate of an annual net alongshore sediment transport directed toward the south at a rate of 174,000 cubic yards per year. *The authors note that this analysis is prone to substantial error in both magnitude and direction because of the uncertainties associated with wave transformation across the complex bottom topography (shoals) just offshore the project area which is not accounted for in the computer hindcast employed in the study*’ (emphasis added) (Aubrey Consulting, Inc, 1990, Siasconset Beach Nourishment Project cited in the FEIR, Lighthouse Beach Shore Protection and Bank Stabilization Project, Nantucket, MA Feb 25, 2000, by Epsilon Associates, Inc., p. 8-4)

Tiffney, et al., (Coastal Zone 1991) states that ‘the unusually high rate of bluff erosion experienced in the vicinity of Sankaty Head lighthouse in the period from 1981 to 1989 appears to be related to storm-induced changes to the offshore shoal configuration.

Epsilon Associates state in their ‘Responses to August 28, 2013 Nantucket Conservation Commission Hearing’, in part, ‘*The rate and direction of sediment transport within the project area are highly variable and therefore not predictable. There is evidence of bi-directional longshore sand transport*’ (emphasis added). Given the dynamic and complex nature of the littoral system at Sconset, any estimate of a detailed sediment budget.....would be subject to enormous uncertainty’. This uncertainty means that there are no reliable or meaningful data available regarding the location to which sediment is transported upon which a reasonable basis for determining an appropriate mitigation program can be developed.

Of particular note is the Coastal Planning and Engineering’s (CP&E) information provided to the SBPF in their 2006 Report, Section 8, Table 10 and Figure 8 which clearly shows a significantly larger volume of sediment being transported to the **north** from the coastal bank, beach and nearshore areas in the project area.

That there is a large volume of source sand provided to the downdrift Quidnet Squam shoreline areas as a result of erosion of the Sconset coastal bank is supported by all technical documents reviewed.

Thus, the concern of the Quidnet Squam Association is possible adverse impacts to their beaches and dunes and possibly landward development if the proposed ‘sand mitigation plan’ does not perform as anticipated by the applicant’s consultants. While we appreciate the proposed sand mitigation plan, *the placement of off-site mitigation sand seaward of the coastal bank and particularly the timing of sediment delivery to the north cannot mimic natural processes*, and could result in adverse impacts to downdrift properties.

### **Summary**

In summary, sufficient and clearly outlined information has not been provided to ensure mitigation will take place along the Quidnet Squam areas, if necessary, including:

1. *How* the applicant’s technical consultants and the Town’s Conservation Commission will distinguish between far-field adverse impacts from the geotube revetment project and natural storm-induced erosion north of the project area, particularly along the Quidnet Squam areas. This evaluation is one of the most important and difficult considerations in the project. An additional outside, unbiased technical analysis will be necessary.
2. if adverse impacts are noted, the timing and process by which the applicants and their technical consultants will document and notify the Commission in writing outlining the type of mitigation that will be provided along the Quidnet Squam shoreline areas, e.g. sand nourishment and vegetation, and how quickly mitigation will be implemented; and,
3. the logistics of providing mitigation in the Quidnet Squam areas, if and when necessary.

Thus, the Quidnet Squam Association requests that the Conservation Commission:

1. **Require not only that the *Southeast Nantucket Beach Monitoring Project* analyses by the Woods Hole Group (or other competent surveying group) continue to monitor the 44 existing beach profiles, but that several additional survey profile locations be added along the Quidnet Squam areas, and that these additional transects and all**

other transects be surveyed not only in April and August, but prior to and immediately following nourishment and pre- and post-coastal storms;

2. **Require a description of how the applicant's technical consultants will distinguish between far-field adverse impacts from the geotube revetment project and natural storm-induced erosion and storm damage north of the project area, particularly along the Quidnet Squam shoreline areas. This evaluation should not be solely between the Town DPW and the Conservation Commission as proposed, but an independent, unbiased technical consultant should be retained to provide an in-depth analysis and recommendation.**
  
3. **Require that a 'beach and dune sand mitigation plan' for the Quidnet Squam shoreline areas be formulated before any project is permitted in the event that adverse impacts are noted along that section of the Nantucket eastern shore.** The logistics and commitment of providing sand mitigation along the Quidnet Squam shoreline and dune areas, if and when necessary, must be clearly outlined and deemed doable by the Commission and involved project specialists. For example, a sand stock-pile reserve in the Quidnet Squam area for immediate post-storm mitigation if adverse impacts are linked to the armoring of the Sconset coastal bank may be appropriate.

The Quidnet Squam Association appreciates the efforts of the Town and the SBPA and have not as yet taken a position on the *Stabilization of Roadway & Utilities in the Public Layout of Baxter Road* project. They are, however, significantly concerned about possible adverse impacts to their downdrift beaches, dunes, barrier beach and possibly landward development that could be caused by the interruption of a major source sediment supply, and a proposed 'sand mitigation plan' that does not take the Quidnet Squam shoreline and coastal resources directly into consideration.

The Association needs assurances from the Town and SBPA that adverse impacts to their property will not occur as a result of the project. Although Milone and MacBroom state 'following this adaptive approach, there is no reason to expect adverse impacts to downdrift beaches', there is actually a high likelihood of potential adverse impacts to downdrift beaches and dunes due to the timing of the introduction of the mitigation sand, as described above.

However, if adverse impacts are noted the Association needs assurances that the adverse impacts will be mitigated as soon as possible. These assurances may be in the form of a technical analysis by the applicant's consultants and an independent technical specialist on how to document potential adverse downdrift impacts which will occur if the major sediment supply, volume and frequency of sand introduction to the littoral system, is interrupted. At the present time these assurances do not exist.

We request that the Conservation Commission require a Quidnet Squam area-specific mitigation plan; an explanation of how the applicant's consultant's will distinguish between natural and project-specific downdrift adverse impacts; and, continued and enhanced beach and dune

monitoring. These should be committed to writing as part of this proposal before considering action of the proposal.

On behalf of the Quidnet Squam Association, we appreciate the opportunity to provide these important comments and will continue to work with the Commission, the Town and the SBPA in hopefully arriving at a mutually agreeable approach to meet all ultimate goals while ensuring no adverse impact to downdrift properties and coastal resources.

Yours Truly,

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Cc: Nantucket Quidnet Squam Association, c/o of Richard Peterson, President  
Atty Dirk Roggeveen, Nantucket

#### Partial References

Gutman, A.L., Goetz, M.J., Brown, F.D., Lemowski, J.K., and Tiffeny, Jr., W.N., 1979, Nantucket Shoreline Survey, M.I.T. Sea Grant College Report, MITS 79-7, Cambridge, MA

Tiffney, W.N. and Andrews, C, 1990, 'Sesachacha & Sankaty: Pond Opening and Erosion on Nantucket's Eastern Shore', in *Historic Nantucket*, V. 38, No. 1, Spring, 1990.

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